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Chapter 5

Performance characteristics of selected/deselected under 11 players from a professional youth football academy.

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ABSTRACT

This study aimed to determine whether players selected for the under 11 (U11) team of a professional youth football academy outperform their deselected peers in physical, technical and gross motor coordination skills, or in psycho-social capacities. Of the young players active at different amateur clubs yearly 2% were scouted to participate at trainings and matches from an academy before the first objective baseline testing (season 1 n=54 boys, season 2 n=49, age, 9.25 ± 0.46). Most of the scouted players (n = 103) were born in the first quarter of the year (47.6%) and started playing football at a young age (4.80 ± 0.84). Mann-Whitney U-tests showed that the selected U11 players (n=31) from the reduced pool outperformed their deselected peers (n=72) in the 30-metre slalom sprint, dribble test and Loughborough soccer passing test, and on sport learning-, motor-, creative-, and interpersonal capacity ($P < 0.05$). A discriminant analysis resulted in a significant discriminant function (Wilks' $\Lambda = 0.673$, df =16 and $P = 0.002$) with 69.6% of players classified correctly. In sum, the current system, tends to scout nine-year old soccer players with multiple years of soccer experience, and well-developed motor skills, who are predominantly born in the first quarter of the year. Of those players, the ones with better physical and technical skills, who are believed to have most potential to become elite in the future are selected. However, 25 of the players with a high probability of being selected were deselected. Whether this system is appropriate serves a broader ethical discussion within contemporary society.

Keywords: Sport, identification, performance, development, exclusion

INTRODUCTION

Every year, approximately 800 (0.5%) of the 180.000 six- to ten-year-old football players in the Netherlands are selected to attend one of the 26 professional youth football academies. Academies start selecting players at young ages for several reasons: 1) the belief that those players who they perceive as having the greatest chance to become successful should be given an optimal development environment (e.g. high-quality peers, coaches, physical conditions) from a young age, 2) fear of missing the new Messi and 3) competition with other academies. Remarkably, research has not paid much attention to the characteristics of players selected in the youngest age groups (i.e. six- to eight-year-old boys) (Johnston, Wattie, Schorer, & Baker, 2018). At present, scouts conduct the initial phase of the selection process to observe, select and deselect the players. In the second phase, professional youth academies select the players who they perceive to be the most promising from the first selection.

Recent insights question the efficacy of these early selections given the dynamic nature of talent identification and talent development (Vaeyens et al., 2008; Güllich, 2013). Moreover, the aim to identify the better football players already appears to be biased in the first step of the Dutch talent system, which resembles the 'sliding population approach' introduced by Régnier and colleagues (1993). To objectify the decisions made in step two, which is the mainstream procedure used by professional youth soccer academies, we adjusted a post hoc baseline test battery aimed at evaluating the current selection procedure.

Scouts mainly select players based on physical skills and performance outcomes (i.e. football-specific skills like sprinting, agility, dribbling and passing) (Lovell, Towlson, Parkin, Portas, Vaeyens, & Cobley, 2015), instead of focusing on measures of potential (Huijgen, Elferink-Gemser, Lemmink, & Visscher, 2014). Performance outcomes have been shown to differ between selected and deselected players in older age groups (16–18 years old) (Baker & Wattie, 2018). However, physical and football-specific skills in youth do not follow a linear trajectory and constantly change over time, which makes early selection highly uncertain (Huijgen, Elferink-Gemser, Post, & Visscher, 2010; Fransen et al., 2017). As such, it is debatable whether early superiorities in players' performance outcomes are associated with future performance (Huijgen et al., 2014). Well-developed gross motor coordination, and psycho-social capacities (e.g., work attitude capacity, sport learning capacity, interpersonal capacity) at a young age are assumed to better represent measures of potential (Abbott & Collins, 2004; Pion et al., 2015; Platvoet Elferink-Gemser, Baker, & Visscher, 2015; Höner & Feichtinger, 2016). More specifically, a recent review by O'Brien-Smith and colleagues (2019) showed the value of the Körperkoordinationstest Für Kinder (KTK; Body Coordination Test for Children, Kiphard & Schilling, 1974, 2007) in the talent pathway of youth athletes. It is imperative that scouts and coaches consider players gross motor coordination and their interaction with psycho-social capacities when selecting young football talent (Bennet, Vaeyens, & Fransen 2018; Sarmento, Anguera, Pereira, & Araújo, 2018). Coaches' perceptions are crucial to assessing players' psycho-social capacities

(Musculus & Lobinger, 2018). Earlier studies have shown that coaches' perceptions have a high prospective validity due to their holistic nature (Sieghartsleitner, Zuber, Zibung, & Conzelmann, 2019; Till et al., 2017).

A well-known phenomenon that influences children's performance is the relative age effect, in which high discrepancies are found in quartile proportions in young age cohorts (Wattie, Cobley & Baker, 2008; Cobley, Wattie, Baker, & McKenna, 2009; Williams, 2010; Wattie, Schorer, & Baker, 2015). In many sports, a higher relative age increases the chances of being selected (Wattie et al., 2015). Older football players also have temporary physical advantages over their peers (Lovell et al., 2015; Figueiredo, Coelho-E-Silva, & Malina, 2011; Gill et al., 2017; Deprez et al., 2014). However, it is important to note that a higher relative age is not directly associated with a child's physical size and athletic aptitude (Malina et al., 2005). The relative age effect is also observed in many non-physical achievement domains such as education and chess. This indicates that the relative age effect is influenced by factors such as experience and cognitive and social-emotional development. A potentially even greater effect can be caused by individual variation in biological maturity (Till et al., 2017). This variation could be up to six years (Till et al., 2017) and increases with competitive level. In a recent study, Johnson and colleagues (2017) showed that the effect of maturity increases with age. No significant differences were reported between early, normal, and later maturing players at the ages under nine, under ten and under 11 (Till et al., 2017). The relative age effect can be seen from early childhood whereas maturity biases emerge at age 11 and the onset of puberty. However, there are few conclusive results about the influence of maturity, relative age effect, their potential interaction and physical and physiological growth as underlying cause (Gil et al., 2017).

Despite literature supporting the importance of a diversified sport programme for young players (e.g. Côté, Lidor & Hackfort, 2009), there is a clear trend towards early entrance and early specialisation (Ford et al., 2012). Early specialisation can be detrimental to both the physical and mental health of athletes, which can lead to dropout. Athletes who specialise early often suffer from burnout due to the repetitive nature of 'deliberate practice' (Gould, Tuffey, Udry, & Loehr, 1996) and a decrease in intrinsic motivation and fun during training sessions (Wall & Côté, 2007). Furthermore, a one-sided load on the body increases the risk of overuse injuries (Bompa & Haff, 2009). To ensure optimal development, children should be given many diverse learning experiences. Therefore, early specialisation is regarded as less favourable (e.g. DiFiori et al., 2014) because it results in exclusion. On the other hand, talented children should not be prevented from developing within a particular sport at a young age.

The current selection procedure in Dutch football academies results in a focus on early specialisation and the exclusion of many children at a young age. It is not known yet whether selected and deselected children exhibit different physical skills and performance outcomes and/or measures of potential. A better understanding could help to improve the current processes by providing youth academies with more evidence-based knowledge. Therefore, the main aim of this

study was to determine whether players selected early for a professional youth football academy outperform deselected players on physical, technical and gross motor coordination skills, or on psycho-social capacities. We hypothesise that since academy selection appears to be made primarily on performance, the selected players will outperform the deselected players on physical and technical skills. It is unclear whether the selected players will outperform the deselected players on gross motor coordination and psycho-social capacities.

METHOD

Participants

Volunteer scouts from the Dutch youth professional football academy observe and select players based on their perceptions. They make their first selection based on weekly visits to regional amateur clubs. There the scouts observe six- to nine-year-old boys playing in regional clubs and identify the players that they perceive to be the most promising. The head of the academy explained that this is an unstructured process in which the scouts have much autonomy in the selection process. Scouts visit the amateur clubs in the weekends and observe most often players, who were already selected by the amateur club, during competitions. The academy does not have strict guidelines or documents for the scouts to objective the scouting process. Every year, according to the volunteer scouts up to 60 of the most promising players are invited to one of the youth academy's five under ten (U10) regional selection training groups. The youth academy's professional scouts observe the players' performance and development continuously over the season. Observations are primarily made in internal competition between the five regional training groups. For five months, each team plays three of the four weekends in a month against one of the other regional selection training groups. Finally, after a screening with the head of the football academy and without interaction with the players' personal coaches or knowledge of the tests' results, the scouts annually select up to 16 players who are, in their perspective, the most promising for the under eleven (U11) team. Every year, less than 2% of all U11 players (N ~ 3250) are scouted by the regional youth professional football academy.

We tested the scouted players (n = 103) from two consecutive cohorts post hoc to identify the characteristics that led to subsequent selection or exclusion at this young age. In this typical early specialisation pool, 103 boys started playing football at a young age (4.80 y ± 0.84 y). Only nine players (9%) had practised another sport in the past and, at the time of the study, none of the selected players were practising another sport.

A first cohort, scouted from 180 clubs during the 2013–2014 season, consisted of 54 players (age 9.26 y ± 0.45 y). The scouted players, who also continued to train at their amateur club, were divided over five training groups and given one additional selection training per week. The five groups – each with 11 to 13 players and their own coach – played an internal competition of three games per month for five months. Six months later, before 1 April, 17 players – representing less than

0.5% of the total pool population – were selected for the next season's U11 team of the first division football club.

The same selection procedure was repeated one year later, in the 2014–2015 season. It resulted in a second cohort of 49 scouted players (aged 9.25 y ± 0.48 y) equally divided over the five training groups (8 to 11 players). After six months, 14 of those players were selected for the U11 team for the 2015–2016 season.

Measurements

For the purpose of this study, a battery of tests was given at the youth academy programme to measure the players' body height and weight, gross motor coordination, and physical and technical skills. The players' skills were assessed in week three or four after the start of the U11 selection training. Psycho-social capacities were determined eight weeks after the start of the U11 selection training by measuring coaches' perceptions.

Chronological age

The difference between the player's date of birth and the date of measurements was used to determine his chronological age.

Anthropometry

Body height was measured with a stadiometer with an accuracy of 0.1 cm. Body weight was measured with a digital balance scale with an accuracy of 0.1 kg. To accurately and reliably assess height and weight, we followed the guidelines outlined by the International Society for the Advancement of Kinanthropometry (ISAK). All players were measured by the same researcher.

Gross motor coordination

We used the Körperkoordinationstest für Kinder (Kiphard & Schilling, 1974, 2007) to assess the players' gross motor coordination. This test is a widely used, valid, and reliable instrument to assess gross motor coordination, and its importance as an indicator for future sport success has been proven (O'Brien-Smith et al., 2019; Ahnert, Schneider, Bös, 2009; Vandorpe et al., 2011). The KTK consists of four subtests: balance, shifting platforms, jumping laterally and hopping over an obstacle. There was a strong correlation ($r = 0.98$, $P < 0.001$) between the KTK motor quotient (MQ) scores based on all four subtests, and the KTK MQ scores based on the three subtests in a sample of 2,902 Flemish children (9.05 y ± 1.69 y vs. 9.26 y ± 0.46 y; 10). Based on that fact, and the results from a study by Novak and colleagues (2016), we decided to exclude the 'hopping over an obstacle' test.

Participants participated in the following three KTK subtests:

Balance – the player walks backwards on a balance beam (3 m long and 5 cm high). There are three beams with decreasing widths (6 cm, 4.5 cm, 3 cm). Three

attempts on each beam are summed. The maximum score is 24 steps (8 per trial) for each balance beam, which comprises a maximum of 72 steps for this test.

Shifting platforms – the player begins with both feet on one platform (25 cm x 25 cm x 5.7 cm) and moves across the floor in 20 seconds by stepping from one plate to another, transferring to the first, stepping on it, and so on. The number of relocations is counted and summed over two attempts.

Jumping laterally – the player jumps laterally over a small wooden slat (60 cm x 4 cm x 2 cm) as many times as possible in 15 seconds. The number of jumps over two attempts is summed.

The (raw) scores were converted into age-specific motor quotients, then summed and divided by three to calculate an overall KTK MQ score.

Physical and technical skills

A 15-metre sprint (0.01 s) was used to measure speed. The player started 0.5 metre behind the starting line. Smart speed devices were set up at the start and finish lines. These automatically registered the exact time the player crossed both lines, which allowed the player to decide when to start. The best of three attempts was taken as the final score. The players had a 20 second rest between the sprints.

Speed and agility were measured by the Slalom Sprint and Slalom dribble Test (0.01 s) (Johnson, Doberty, & Freemont, 2009). The time was measured with smart speed devices. Players had to sprint 30 metres while changing direction 12 times (12 120° turns) around cones set two metres apart. The test was performed twice, once without a ball (Slalom Sprint) and once while dribbling a football (Dribble Test). If the player was more than approximately 2 metres away from the cones, the test was repeated. The reliability and validity of the slalom dribble for intermittent sports has been confirmed (Lemmink, Elferink-Gemser, & Visscher, 2004).

The Loughborough Soccer Passing Test (LSPT) assessed the speed of skill execution and passing accuracy. The LSPT has been proven to be a reliable and valid method to test differences in player's passing skills (Ali, Williams, & Hulse, 2007). The test set-up consists of a 12 x 9.5 metre court defined by four gymnastics benches, with each bench representing a colour (each bench held a 0.6 x 0.3 metre coloured card). The examiner yelled out one of the four colours, whereupon the player had to react by shooting at the correct colour card. The time needed to complete 16 similar actions was measured using a stopwatch. Penalty time resulting from false or incorrect actions was added to the total time. For a more detailed description of the test, see Ali and colleagues (2007).

Psycho-social capacities

The Scale for Identification of Sport Potential (SISP) (Platvoet et al., 2015) was used to measure the coaches' perceptions of a player's psycho-social capacities. The SISP consists of 27 items divided over the six capacities: work attitude

capacity (three underlying items: e.g. always tries to get the best out of himself, is goal oriented); sport learning capacity (nine underlying items: e.g. acquires skills rapidly, likes to learn new movements); creative capacity (three underlying items: e.g. uses original solutions to movement problems); motor capacity (three underling items: e.g. good balance, jump capacity); interpersonal capacity (six underlying items: e.g. can make peers enthusiastic, often takes the lead in team work); and intellectual capacity (three underlying items: e.g. is highly intelligent, is one of the smartest students in class). The reliability and internal validity of the SISP were confirmed, where Cronbach's α ranged from .73 to .87 and ICCs of the capacities varied between .71 and .90 (Platvoet et al., 2015). An ICC of .70 is considered acceptable (Litwin, 1995). The five coaches filled in the SISP online for each player in their group. The coaches observe the players several times a week in training sessions and matches and are expected to be able to score each player on each item. All coaches had an official coaching licence and at least five years' experience in coaching youth. The specific response stem was 'In the last six weeks, the player has …' followed by one of the 27 items. Coaches scored their level of agreement on a five-point Likert scale (1 = strongly disagree to 5 = agree very much) on each item.

Data analysis

Descriptive statistics were obtained for all measurements and data were analysed using SPSS version 20.0. The number of players born in each of the four birth quarters was calculated for selected and deselected players. A non-parametric chi-square test was then used to examine a possible relative age effect, comparing the percentage per birth quarter with an expected distribution of 25%.

The Shapiro-Wilk test was used to determine the goodness of fit. Multiple variables were not-normally distributed ($P < 0.05$). Therefore, the one-tailed Mann-Whitney U test was applied to determine whether there were differences between selected and deselected players on all measurements. To interpret the U scores, we calculated effect sizes. Cohen (1992) suggested that effect sizes be evaluated as small (0.1), medium (0.3) or large (0.5).

A discriminant analysis, with the selection as a grouping variable and the significant variables of the Mann-Whitney U test as dependent variables, determined whether the test results could predict whether a player could be assigned to the selection. In addition, crosstabs were used to determine the difference between current membership (selected vs deselected) and predicted group membership (high probability to be selected vs high probability to be deselected). A P value of 0.05 was used for all tests of significance.

Ethical approval

The study fits the established ethical standards for sports medicine (Harris & Atkinson, 2011). The review board of HAN University of Applied Sciences approved the study. Data are stored on the university's secured servers; on request, it can be

shared. The study was explained to the head of the youth academy, trainers and scouts. All parents were informed and gave written consent for their children to participate.

RESULTS

Age & anthropometrics

47.6% (n =49) of the scouted players were born in the first quarter of the year, and 20.4% (n =21); 14.6% (n =15) and 17.5% (n =18) of the players were born in the second, third and fourth quarters, respectively. A chi-square test found significant differences (χ =28,689; df =3; P <0.001) between the expected distribution of 25.0% per birth quarter and the actual birth quarter distribution.

Players selected and deselected for the U11 team did not differ in chronological age or the age at which they began playing football. Half of the selected players (52%; n =16) were born in the first quarter, while 16.1% (n =5), 9.7% (n =3) and 22.6% (n =7) were born in the second, third and fourth quarters, respectively. For the deselected players, the results were as follows: Q1= 45.8% (n =33), Q2= 22.2% (n =16), Q3= 16.7% (n =12) and Q4= 15.3% (n =11). No differences were found between the anthropometrical characteristics of selected and deselected players.

Gross motor coordination

No differences were found between selected and deselected players (P > 0.05) on the three gross motor coordination tests of the KTK and the KTK MQ. See Table 2.

Physical & technical skills

The selected players (mean 14.87 ± 0.74 s) outperformed the deselected players (mean 15.25 ± 0.76 s) on the 30-metre slalom sprint test (U = 797.5, z =-2.29, P <0.05, r =-0.25). Selected players (mean 23.34 ± 1.77 s) also performed better on average than the deselected players (mean 24.11 ± 1.81 s) on the dribble test (U =868, z =-1.78, P <0.05, r =-0.21) and the LSPT (mean 64.25 ± 10.02 s vs. mean 71.92 ± 13.30 s; U =724, z =-2.82, P <0.05, r =-0.31). For the 15-metre sprint, no differences were found between selected and deselected players (P >0.05).

Psycho-social capacities

In coaches' perceptions, the selected players outperformed the deselected players on four of the six capacities of the SISP (P <0.05). Selected players had higher scores on sport learning capacity (mean 3.44 ± 0.65 vs. mean 3.14 ± 0.49; U=876, z =-1.73, P <0.05, r=0.25), creative capacity (mean 3.36 ± 0.53 vs. mean 3.02 ± 0.65; U=805, z=-2.29, P <0.05, r=0.26), motor capacity (mean 3.20 ± 0.55 vs. mean 2.92 ± 0.48; U=805,5, z=-2.36, P <0.05, r =0.26) and interpersonal capacity (mean 3.46 ± 0.53 vs. mean 3.31 ± 0.46; U=879,5, z=-

2.71, P <0.05, r=0.15). No significant differences were found for work attitude capacity and intellectual capacity.

Table 2 shows the mean scores of selected and deselected players on all tests.

Table 1. Descriptive statistics of all identified players (n=103)

	Mean	**SD**	**CI (95%)**	**Range**	**Min - Max**
General characteristics					
Age	9.28	0.45	9.19 – 9.38	1.72	8.20 – 9.92
Starting age for football	4.74	0.97	4.54 – 4.96	7.00	3.00 – 7.00
Body height (m)	136.85	5.77	135.61 – 138.09	30.50	125.00 – 155.50
Body weight (kg)	30.04	3.36	29.38 – 30.77	14.10	23.90 – 38.00
Physical & technical skills					
Sprint (15 m) (s)	2.63	0.48	2.54 – 2.74	1.45	1.82 – 3.27
Slalom sprint (30 m) (s)	15.18	0.74	15.02 – 15.34	3.63	13.29 – 16.92
Slalom dribble (30 m) (s)	23.76	1.86	23.36 – 24.16	9.62	19.71 – 29.33
Skill execution & passing accuracy (s)	70.85	12.81	68.09 – 73.62	62.65	43.60 – 106.25
Gross motor coordination					
Balance	87.91	12.91	85.13 – 90.70	53	62 – 115
Jumping laterally	112.84	14.14	109.80 – 115.89	59	86 – 145
Shifting platforms	111.82	21.60	107.16 – 116.48	60	85 – 145
Motor Quotient score	107.51	10.75	105.20 – 109.83	47	86.25 – 133.25
Psycho-social capacities					
Work attitude capacity	3.43	0.67	3.29 – 3.58	3	2-5
Sport learning capacity	3.26	0.59	3.13 – 3.39	3	2-5
Creative capacity	3.10	0.66	2.95 – 3.24	2	2-4
Motor capacity	3.00	0.56	2.88 – 3.12	2	2-4
Interpersonal capacity	3.36	0.51	3.25 – 3.47	3	4-2
Intellectual capacity	3.23	0.49	3.12 – 3.33	3	5-2

Table 2. Mean and standard deviation of selected (n=31) and deselected (n=72) players and the results of the Mann-Whitney U-test (U- and P-values) and effect sizes (r)

	Selected (n = 31)	**Deselected (n = 72)**	**U**	**P**	**Effect size**
General characteristics					
Age	9.35 ± 0.41	9.21 ± 0.47	930	0.181	0.16
Starting age for football	4.57 ± 0.75	4.90 ± 0.86	706	0.081	-0.20
Body height (m)	137.08 ± 6.38	136.53 ± 6.03	1073	0.379	0.10
Body weight (kg)	30.15 ± 3.89	29.99 ± 3.13	1096.5	0.444	0.02
Physical & technical skills					
Sprint (15 m) (s)	2.52 ± 0.50	2.55 ± 0.49	980.5	0.165	-0.03
Slalom sprint (30 m) (s)*	14.87 ± 0.74	15.25 ± 0.76	797.5	0.011	-0.25
Slalom dribble (30 m) (s)*	23.34 ± 1.77	24.11 ± 1.81	868	0.038	-0.21
Skill execution & passing accuracy (s)*	64.25 ± 10.02	71.92 ± 13.30	724	0.003	-0.31
Gross motor coordination					
Balance	88.32 ± 11.09	90.18 ± 14.17	1043	0.300	-0.07
Jumping laterally	112.39 ± 15.44	115.01 ± 15.19	997.5	0.197	-0.09
Shifting platforms	110.97 ± 19.36	114.22 ± 22.64	1102	0.460	-0.08
Motor Quotient score	103.89 ± 11.80	106.47 ± 14.30	1027.5	0.263	-0.10
Psycho-social capacities					
Work attitude capacity	3.40 ± 0.67	3.41 ± 0.63	1071	0.372	-0.01
Sport learning capacity*	3.44 ± 0.65	3.14 ± 0.49	876	0.042	0.25
Creative capacity*	3.36 ± 0.53	3.02 ± 0.65	805	0.011	0.28
Motor capacity*	3.20 ± 0.55	2.92 ± 0.48	805.5	0.009	0.26
Interpersonal capacity*	3.46 ± 0.53	3.31 ± 0.46	879.5	0.044	0.15
Intellectual capacity	3.26 ± 0.52	3.19 ± 0.45	1078	0.390	0.07

*P< 0.05
Note 1. Effect sizes for U are small for all variables except for 'Skill execution & passing accuracy', for which a medium effect was found.

Discriminating between selected and deselected players

The discriminant analysis discriminated between the 31 selected players and the 72 deselected players on the seven significant variables of the Mann-Whitney U test and resulted in a significant discriminant function (Wilks' Λ =.812, df =7 and P <0.05). The highest canonical coefficients were found for the slalom sprint (0.592), LSPT (0.561), and sport learning capacity (-0.507). Sport learning capacity has a negative sign because a higher score denotes a better capacity. Of the cases, 69.9% were correctly classified and cross-validation resulted in a 66.0% correct classification. This is also illustrated in Figure 1. A large group of selected and deselected players have similar test scores which is visualised by the overlap between the drawing around the cones (selected players) and circles (deselected players).

The crosstab calculation between current membership (selected vs deselected group) and predicted membership (high probability to be selected vs high probability to be deselected), showed that six (19%) of the selected players had a high probability to be deselected. 25 (80.6%) of the selected players had a high probability to be selected. Of the deselected players, 47 (65%) had a high probability to be deselected while 25 players (34.7%) had a high probability to be selected and were actually deselected. There are no hard criteria to decide whether a 66.0% correct classification is low, moderate, or good. However, the results of this analysis reveal that almost one third of the players, based on their test results, are not placed correctly. That could be interpreted as a 'fairly poor result' in this specific context.

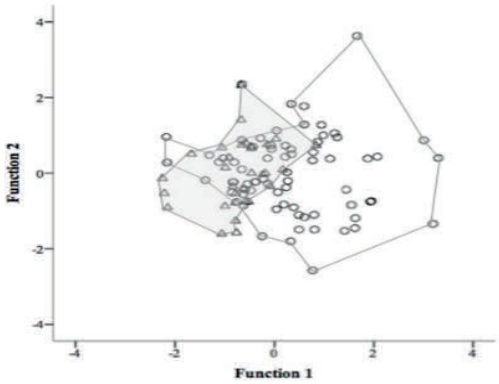

Figure 1. Discriminating between selected and deselected players.
De-selected players = o, Selected players = Δ

Note: For this discriminant analysis, the variables Slalom sprint (30m), Dribble test, LSPT, Sport learning capacity, creative capacity, motor capacity and interpersonal capacity were used. A third group with one case (with mean score of the total group) Was addedd to visualize the results

DISCUSSION

The main aim of this study was to determine whether players selected early for a professional youth football academy outperform deselected players on physical, technical and gross motor coordination skills, or on as psycho-social capacities. The results showed that selected players outperformed the deselected players on average on most assessed skills and capacities, but we found no differences in their anthropometrical characteristics and gross motor coordination. We found differences between selected and deselected players in terms of their football-specific performance capacities and psycho-social capacities, which reflects the presence of a combination of skills in the selections (MacNamara, Button, & Collins, 2010; Holt & Dunn, 2004). The differences in coaches' perceptions of selected and deselected players' psycho-social capacities stress the importance of considering these capacities during selection procedures. This is especially important since exhibiting these capacities at a young age is assumed to be an indicator of a child's ability to develop sport-specific performance skills (Abbott & Collins, 2004; Platvoet et al., 2015; Faber, Elferink-Gemser, Oosterveld, Twisk, & Nijhuis-Van der Sanden, 2016). Qualities like work attitude capacity, sport learning capacity and interpersonal capacity are difficult to measure, especially in young children, and coaches' perceptions provide valuable insights (Sieghartsleitner et al., 2019). Still, future studies should focus on the measurement and developmental character of these capacities. It is important to emphasise that the relative age effect biased the complete players pool, since 47.6% of the players were born in the first quarter of the year. After the coaches' selection, the selected and deselected players did not differ in chronological age.

Selected and deselected players exhibited no differences in work attitude capacity. This capacity, with items like 'likes to work hard' and 'works goal-directed', appears similar to capacities like discipline, commitment and resilience. Holt and Dunn (2004) found that these capacities are important among 16-year-old elite football players. Apparently, a good work attitude capacity is a prerequisite for being scouted but it is not a discriminating variable in already scouted players. The same seems to hold for gross motor coordination. Based on the results presented in football (Deprez et al., 2014; Vandendriessche et al., 2012), and other sports like volleyball and table tennis (Pion et al., 2015; Faber et al., 2016), players with excellent gross motor coordination have a high chance of future success. In this pool of young football players, 28 (27%) had a KTK MQ of 116 or higher, which may be an indicator of future success (Vandorpe et al., 2011). However, 21 (75%) of them were deselected, suggesting that trainers and coaches value football-specific skills more highly when choosing the selection team. For motor coordination, divergent results were found when evaluated in a subjective (coaches' perceptions) and objective (KTK performance) way. A reasonable explanation might be that professionals with a sport-specific background have more difficulties identifying more general skills (e.g. motor coordination). Therefore, we suggest that, if applicable, more objective measurements should be used to assess players.

Despite the differences between selected and deselected players, several

components make the current selection process questionable. First, the players scouted from the local amateur clubs are characterised by their early specialisation and early start in football. This phenomenon has also been shown in research by Vandendriessche and colleagues (2012) (football) and Faber and colleagues (2016) (table tennis) and reveals that performance outcomes rather than measures of potential primarily seem to influence scouts' decisions in selection processes (Wattie & Baker, 2015).

In addition, our results do not provide evidence for one unique U11 football profile. Based on their test scores, 25 deselected players had a high probability of being selected. Their exclusion might be explained by the subjectivity of the current procedure in which scouts and coaches' observations play a dominant role (Gonçalves, Rama, & Figueiredo, 2012; Christensen, 2009), and the fact that academies select a small number of players yearly. Professional youth academies should realise that, given current selection methods, early selection increases the chance of selecting false positives (Baur, 1988) and/or especially excluding players who probably have potential but are not yet able to perform at the same level as some peers (Johnston et al., 2018; Vaeyens et al., 2008). Giving young players more time to develop their potential (i.e. by not excluding them) is expected to result in a better talent identification and talent development processes. Currently, only 66% of the players in this study were classified correctly by the discriminant analysis, which is a fairly poor result (Woods, Raynor, Bruce, MacDonald, & Robertson, 2016). Therefore, we advise against selecting at such early ages.

There are limitations to this study. First, we do not know whether the academies perceived each selected player to be equally promising. Some players may be selected not because of their well-developed characteristic and/or performance skills but to complete the U11 selection with the required 16 players. The academy might also perceive more than 16 players to be equally promising but have to deselect some since the academy only selects 16 players for the U11 team. Second, psycho-social capacities were analysed by coaches' perceptions. More research is needed to determine the validity of coaches' perceptions of these capacities. Third, we did not assess the players' maturity status. Maturity status could have influenced the players' (physical) performance and the selection process (Johnson, 2009), although not much is known about the extent to which maturity has an influence at this age. Future research should determine the influence of biological, social, cognitive, and emotional maturation in boys in this age group. These limitations suggest that more studies with a longitudinal design are necessary to increase our understanding of the processes of selecting young football players who might become successful (Huijgen et al., 2014; Cobley & Till, 2017; Leyhr, Kelava, Raabe, & Höner, 2018; Elferink-Gemser, Jordet, Coelho-E-Silva, & Visscher, 2012).

In conclusion, this study with pre-liminary data, based on a cross-sectional sample illustrated that multiple component variables were likely related to selection and deselection. The youth academy selects no more 16 children per year, resulting in the exclusion of many others. The results show the importance of psycho-social capacities. Nevertheless, the youth academy also selects on performance outcomes,

the relevance of which is doubtful at this age. The results of our study suggest that many of the deselected players may be false-negatives and we advise the retention of more players on the selection teams at such a young age. Probably the best solution is not to select at young ages and to offer all children equal opportunities that meet their personal developmental demands. Longitudinal performance monitoring of all youth players and gaining more knowledge about the individual development of young players are recommended to further investigate the effectiveness of current selection procedures. Nonetheless, the selection of future football stars will remain a tremendous challenge, as only a few children who start playing football can ultimately become elite players.

Practical implications

This study gives practitioners insight into current selection processes. A better understanding of young player's potential is highly important. Psycho-social capacities could be assessed by analysing coaches' perceptions. Clubs should be aware that the current selection methods lead to selection of the best youth performers in the 'here-and-now', but they probably miss future world-class players by starting the scouting and selection procedures at such young age and only selecting a few players. The current procedure also results in a strong relative age effect in the first step of the selection process. Clubs/ academies are advised to better use the recent findings about procedures to reduce the relative age effect, for example by using visual clues (Mann & Ginneken, 2017). It is important that academies realise that longitudinal monitoring of all youth players combined with programmes that meet each young player's developmental demands is advised. Still, whether the current system is appropriate serves a broader ethical discussion within contemporary society.

Declaration of interest statement
The authors report no conflict of interest.

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